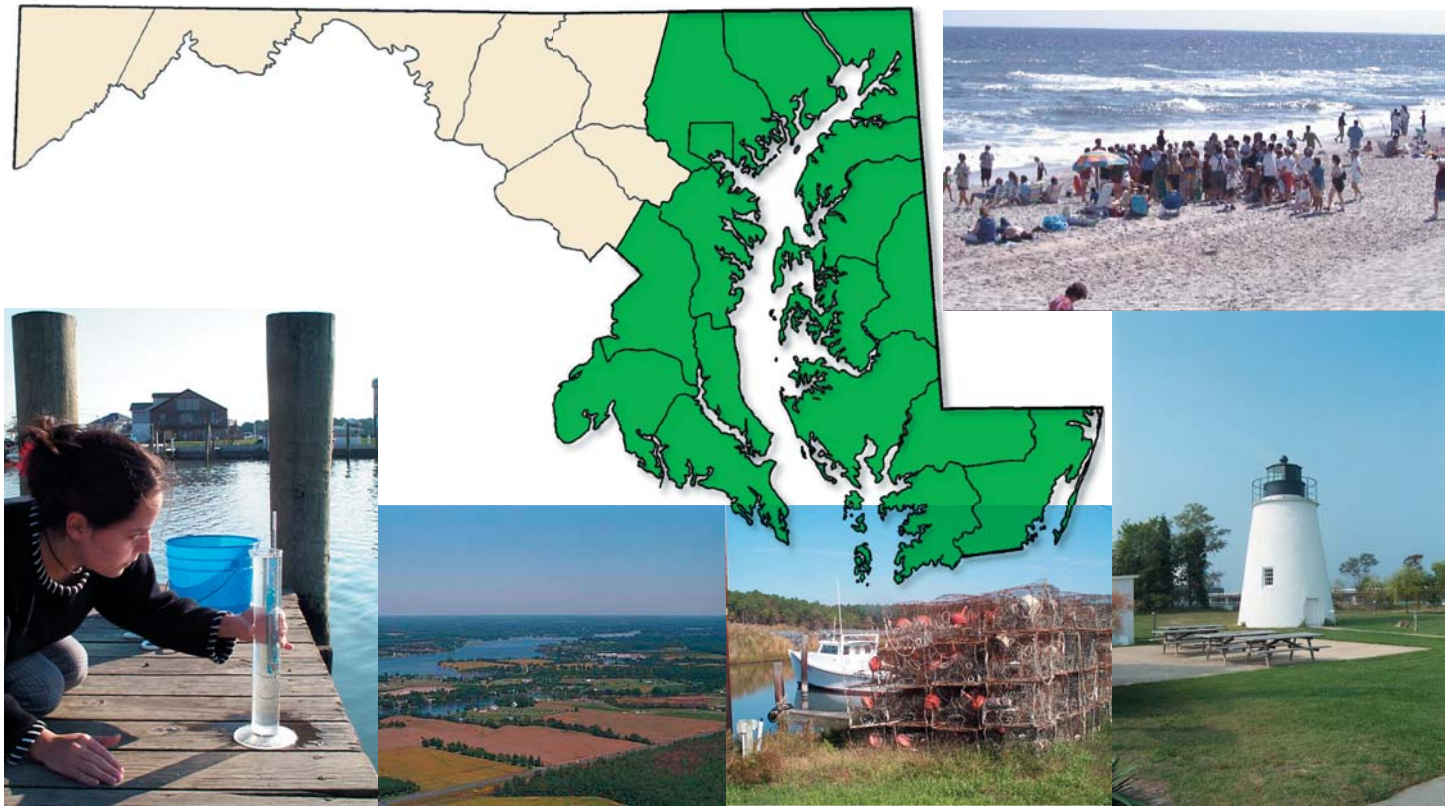
Maryland's Coastal Program



Accomplishments Report

1997-2002

Published 6/2003.

Printed on recycled paper.

Written & Edited by
Katheleen Freeman, Zoe Johnson, Erin McMahan, Mary Conley, Audra Luscher, Gwynne Schultz, Cornelia Pasche Wikar, Louise Hanson, Laura Callahan, & Kerry Kehoe

Layout & Design
Katheleen Freeman

Historic Sketches courtesy of NOAA National Marine Fisheries Historic Image Collection

Maryland Coastal Program
Chesapeake & Coastal Watershed Service
Maryland Department of Natural Resources
Tawes State Office Building, E-2
580 Taylor Ave
Annapolis, MD 21401

Toll Free in Maryland: 1-877-620-8DNR Ext. 8730
Out of State: 410-260-8730
TTY users call tThe Maryland Relay
www.dnr.state.md.us

Financial assistance provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration (NOAA). A publication of the Maryland Coastal Program, Department of Natural Resources pursuant to NOAA Award No. NA17OZ2337.

Maryland Coastal Program Accomplishments 1997-2002

Major Initiatives

Maryland's Coastal Zone includes 16 counties and Baltimore City, extends across two-thirds of the State, and is home to 70% of the State's residents.

Upon approval of Maryland's Coastal Program in 1978, partnerships with local governments, state agencies, and universities were formalized and incorporated into a network that makes up the Maryland Coastal Program. The networked nature of the Program fosters cooperation and collaboration between partners working towards balancing economic development and resource protection. The Program addresses numerous coastal issues, including coastal hazards, water quality, habitat restoration, growth and development, and public access to the coast.

Three broad coastal goals have been set by our federal partner, the National Oceanic and Atmospheric Administration (NOAA): sustainable coastal communities, sustainable coastal ecosystems, and improving government efficiency. Maryland's Coastal Program has worked towards achieving these goals and has significant accomplishments to highlight. An advisory committee made up of local government representatives, citizens, environmental organizations, and business representatives advises the Program on current issues on a local, state, and national level.

The Coastal Program uses a combination of federal funding authorized through the federal Coastal Zone Management Act and State funding to implement its programs. Several key accomplishments spanning from 1997 to 2002 are highlighted in this report.

Maryland's Coastal Bays

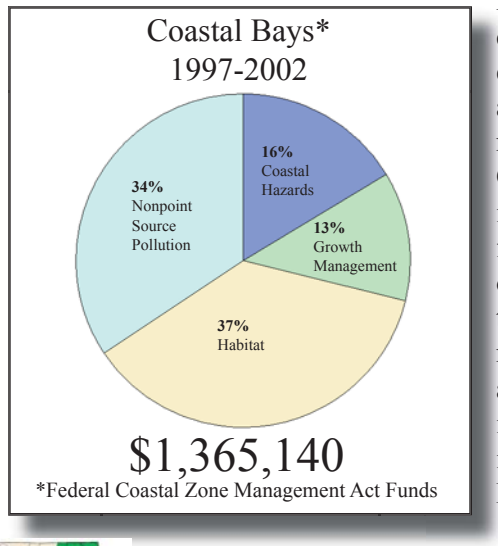
Aquatic Sensitive Areas Initiative
Watershed Planning
Atlantic Coastal Bays Protection Act
Financial & Technical Assistance

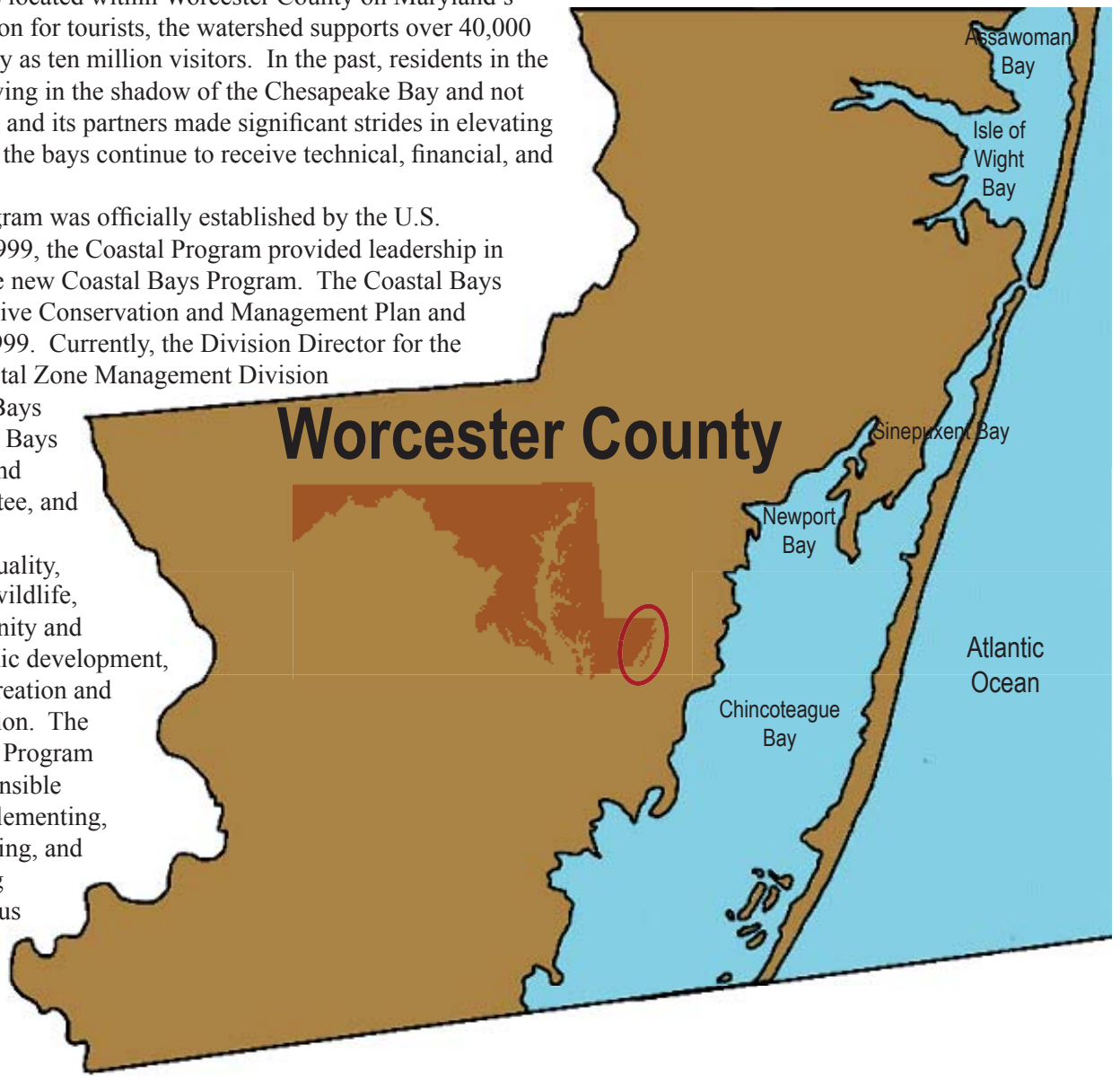
Maryland's Atlantic Coastal Bays

Maryland's Atlantic Coastal Bays are located within Worcester County on Maryland's Eastern Shore. A popular destination for tourists, the watershed supports over 40,000 year-round residents and annually attracts as many as ten million visitors. In the past, residents in the coastal bays watershed have felt the bays were living in the shadow of the Chesapeake Bay and not receiving needed attention. The Coastal Program and its partners made significant strides in elevating the attention given to this region, and in ensuring the bays continue to receive technical, financial, and public support.

In 1996, the Maryland Coastal Bays Program was officially established by the U.S. Environmental Protection Agency. From 1996-1999, the Coastal Program provided leadership in establishing priorities and setting direction for the new Coastal Bays Program. The Coastal Bays Program simultaneously released its Comprehensive Conservation and Management Plan and established itself as a nonprofit organization in 1999. Currently, the Division Director for the Maryland Department of Natural Resources Coastal Zone Management Division serves on the Board of Directors for the Coastal Bays Program and additional staff serve on the Coastal Bays Program's implementation committee, tracking and evaluation subcommittee, sensitive areas committee, and navigation and dredging advisory group.

The Management Plan addresses water quality, fish & wildlife, community and economic development, and recreation and navigation. The Coastal Program is responsible for implementing, overseeing, and tracking numerous action items in the Plan.





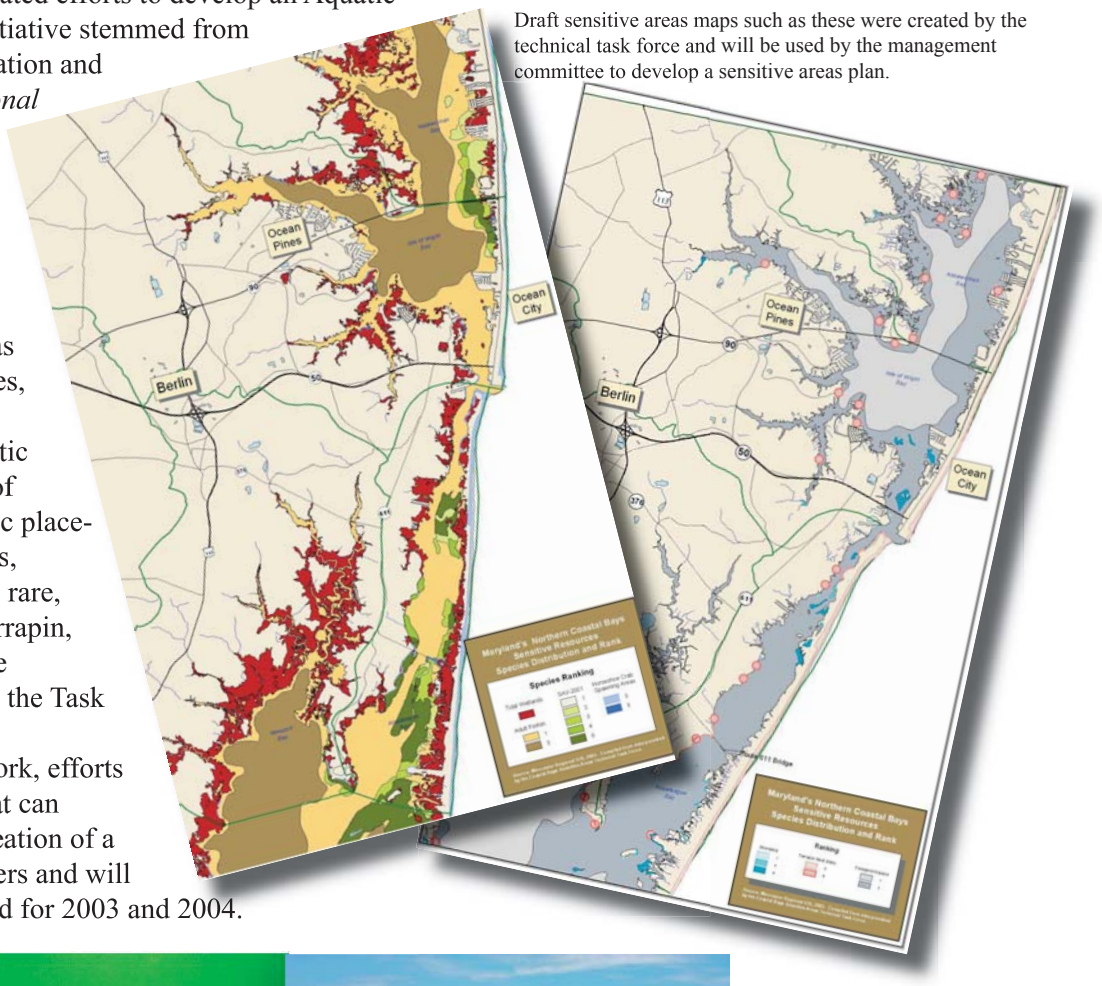
http://www.dnr.state.md.us/bays/czm

Maryland's Atlantic Coastal Bays: Aquatic Sensitive Areas Initiative

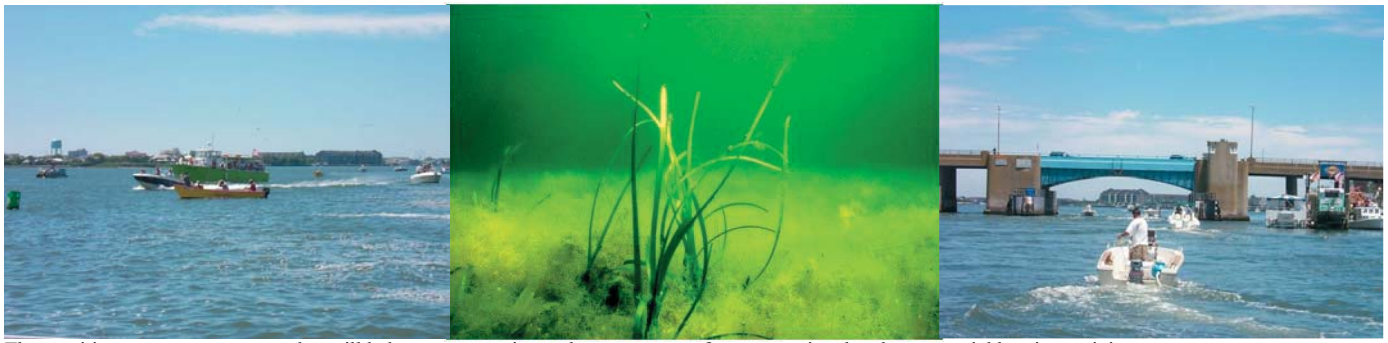
In September 1999, the Maryland Coastal Program initiated efforts to develop an Aquatic Sensitive Areas Management Plan for the coastal bays. This initiative stemmed from the Comprehensive Conservation and Management Plan, Recreation and Navigation Goal 3, *Balance Resource Protection with Recreational Use*. Recognizing the relationship between water-use activities and aquatic resources, the plan calls for the (1) identification of sensitive estuarine resources, (2) evaluation of the risk from specific recreational activities, and (3) development of appropriate management tools that could mitigate the threats.

A Sensitive Areas Technical Task Force, comprised of resource experts from government agencies and universities, was charged with identifying and mapping aquatic sensitive resources, reviewing the relationship between water-based threats and the identified resources, and ranking the resources to identify "aquatic sensitive areas." The mapping exercise included a wide-range of aquatic species, often mapped using priority habitats and specific place-based data. Species included finfish, blue crab, shellfish (oysters, scallops, ribbed mussels), colonial water birds, horseshoe crabs, rare, threatened and endangered species, shorebirds, diamondback terrapin, and seagrasses. Sensitive areas were identified by overlaying the individual sensitive resource maps. A draft report developed by the Task Force is currently under review.

Now that the Technical Task Force has completed its work, efforts are underway to identify management and education options that can help balance the water use activities with the resources. The creation of a management plan will require input from a variety of stakeholders and will include efforts to gain public feedback. These efforts are planned for 2003 and 2004.



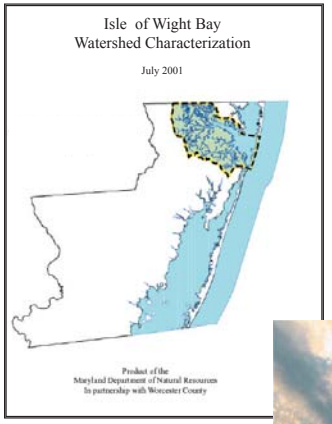
Draft sensitive areas maps such as these were created by the technical task force and will be used by the management committee to develop a sensitive areas plan.

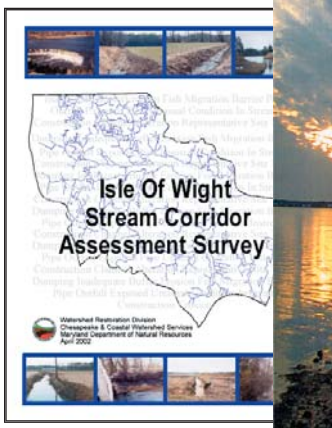


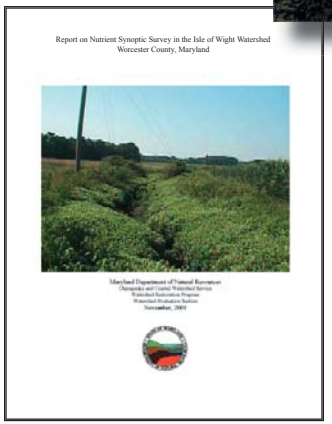
The sensitive areas management plan will help protect species such as seagrasses from recreational and commercial boating activity.

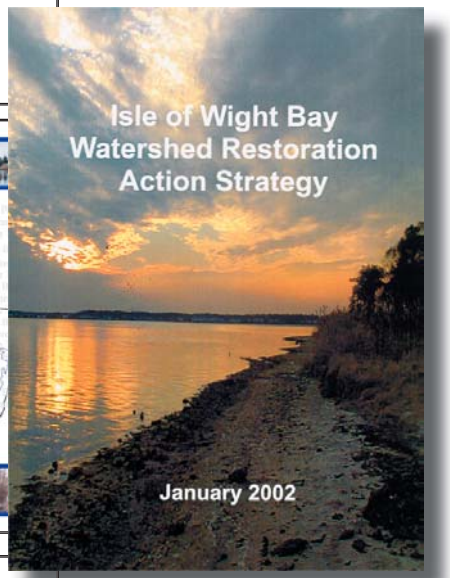
http://www.dnr.state.md.us/bays/czm

Maryland's Atlantic Coastal Bays: Watershed Planning









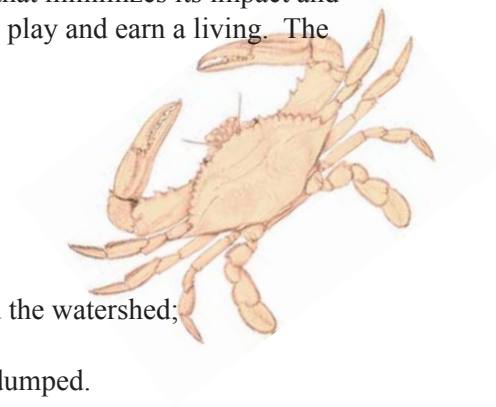
Three documents were produced by the Department of Natural Resources using Coastal Program Funding: A watershed characterization, stream corridor assessment, and nutrient synoptic survey. Each of these documents was used by Worcester County to develop the overall Watershed Restoration Action Strategy.

In 2000, the Coastal Program funded and participated in an effort with Worcester County to develop a Watershed Plan for the Isle of Wight Subwatershed, one of five subwatersheds in the coastal bays. This 74 square mile watershed contains Worcester County's most intense development, substantial water and land-based recreational assets, and over 24,000 acres of productive forest and farmland. The goal of the watershed plan was to protect the watershed assets and provide for their appropriate use in order to maintain the County's quality of life and economic future.

The *Isle of Wight Watershed Restoration Action Strategy* incorporated several of the actions of the Comprehensive Conservation and Management Plan. Specifically, the plan looked to "enhance the buffering capacity of the watershed's tidal and nontidal shoreline area." In addition, the plan considered land use planning and growth management, habitat conservation, erosion and sediment control, stormwater management, and individual and collective stewardship actions.

The goal of the final plan is to accommodate growth in a way that minimizes its impact and enables the watershed to continue as an excellent place to live, play and earn a living. The plan includes the following primary subgoals:

(1) maintain and improve ground and surface water quality;
(2) foster responsible development;
(3) enhance natural habitat;
(4) improve stormwater management;
(5) create a sustainable tourism industry;
(6) maintain a sustainable agricultural community;
(7) have residents take action to protect, restore, and steward the watershed;
(8) have sustainable resource harvesting; and
(9) reduce the amount of solid waste generated, stored, and dumped.



As a result of the plan, essential information was readily available to Worcester County staff in developing their critical area program after the passage of the *Atlantic Coastal Bays Protection Act*. In the immediate future, three large stormwater drainage ditches will be converted into a combined nontidal and tidal wetlands area due to recommendations in the plan, and other tidal wetland restoration projects are now being planned. Using funding from the Coastal Program, efforts are now underway to develop watershed strategies for two more subwatersheds, the Newport and Sinepuxent Bays watersheds. This effort will be completed in 2004 and follows the same format as the Isle of Wight Plan.

"I can't think of anything that would improve the program, all our DNR related experiences were extremely positive".

-David Honick, Worcester County Department of Comprehensive Planning

http://www.dnr.state.md.us/bays/czm

Maryland's Atlantic Coastal Bays: Atlantic Coastal Bays Protection Act

The Maryland Coastal Program and its partners provided essential information and support during the development of the *Atlantic Coastal Bays Protection Act*. The Act essentially incorporated the coastal bays and tributary streams into the 1984 *Chesapeake Bay Protection Act*, often referred to as the "Critical Area Act." Through this Act, local governments along the coast are charged with developing critical area programs with funding and technical assistance from the State.

Activities on the land immediately surrounding coastal waters have a great impact on the coastal bays water quality and wildlife habitat. The "Critical Area" is defined as all lands within 1000 feet of the tidal waters' edge, or from the landward edge of adjacent tidal wetlands, and the lands under them. Local jurisdictions, including Worcester County and Ocean City, were required to classify the lands within the critical area as:

(1) *Intensely Developed Areas* – where residential, commercial, institutional, and/or industrial land uses predominate;
(2) *Limited Development Areas* – where development is of low or moderate intensity; and
(3) *Resource Conservation Areas* – characterized by nature-dominated environments or resource utilization activities.

In addition to the 1000-foot critical area boundary, a 100 foot buffer of natural vegetation is established landward from the Mean High Water Line of tidal waters or the edge of tidal wetlands and tributary streams for development. This helps to protect water quality, and plant, fish, and wildlife habitat.

Limited Development and Intensely Developed Areas

Worcester County ranks second in growth rate among all other Maryland counties, and the coastal bays watershed experienced a 50% population increase between 1990 and 2000. Specific development criteria apply to each of these land use classifications to protect water quality and preserve habitat.

Resource Conservation Areas

Agriculture, a major land use and source of economic revenue for Worcester County, is included in *Resource Conservation Areas* classification of the Critical Areas Act. Farms located within the Critical Area must have a Soil Conservation and Water Quality Plan (SCWQ) in place. Best Management Practices are applied to sensitive areas, such as wetlands and the shoreline.

Photos courtesy of USDA

http://www.dnr.state.md.us/bays/czm

Maryland's Atlantic Coastal Bays: Financial and Technical Assistance

In addition to the Coastal Program's participation in the planning activities referenced above, the Program has also provided funding and technical assistance to support numerous activities in the coastal bays. These include, but are not limited to: installing Best Management Practices (BMPs) to reduce nonpoint source pollution, developing soil conservation and water quality plans, supporting data-collection, conducting scientific research, and increasing public access to the coastal bays.

Worcester County, in particular, used Coastal Program funding to initiate public education projects; improve infrastructure in the Planning, Permits, and Inspections Office; develop environmental guidelines for golf course development; develop Worcester County's coastal bays Rural Legacy Program; and develop plans for native habitat enhancement on public properties. Two documents resulted from this funding: *A Landowner's Guide to Worcester's Sensitive Areas* and *Voluntary Environmental Guidelines Recommended for Golf Courses in Worcester County and the Delmarva Peninsula*.

Golf Course in Worcester County

The County also used Coastal Program funding to undertake certain implementation actions of the Coastal Bays Management Plan, including forest conservation and wetlands activities:

- **Conservation of forest resources** was strengthened through (1) a review of the current law, (2) the creation of a forest mitigation banking program, (3) the update of the existing law pursuant to State statutory code changes, (4) changes in the law to reflect a hierarchy for prioritization of protection of sensitive forest areas, and (5) the coordination of forest-related activities such that large blocks of forest are protected and/or established.
- Funding further supported the continued participation in and facilitation of the **Interagency Wetlands Planning Group**, changes to subdivision regulations that ensure increased protection of wetlands during subdivision, and the development and maintenance of a database of wetlands restoration projects completed and underway in the County.

Seagrass

There are two primary species of seagrass that grow in Maryland's Coastal Bays, eelgrass and widgeon grass. Most seagrass in the coastal bays was eliminated by disease in the 1930's. Since annual seagrass monitoring has been conducted beginning in the mid 1980's, the coastal bays populations have increased at a rate greater than most areas in the Chesapeake Bay. The Maryland Coastal Program annually contributes funding to the Virginia Institute of Marine Science to survey seagrasses in the coastal bays through aerial photography.

Eelgrass, *Zostera marina*, with a seahorse. Photo courtesy of Maryland DNR, Tidewater Ecosystem Assessment.

Widgeon grass, *Ruppia maritima*, Photo courtesy of Maryland DNR, Tidewater Ecosystem Assessment.

Aerial photography showing seagrass scarring from recreational and commercial boating activity.

Coastal Hazards

Shore Erosion
Sea Level Rise
Dredge Material Management

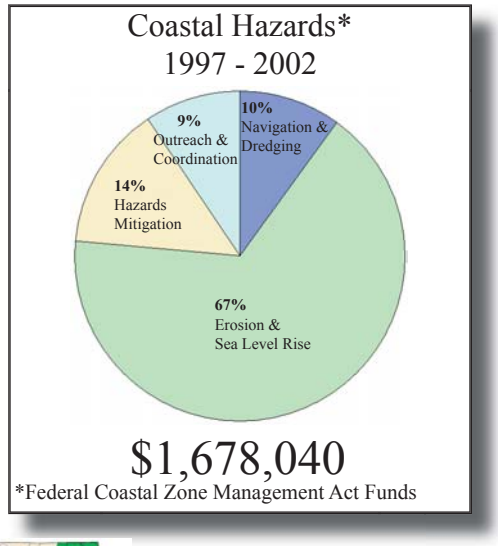
Coastal Hazards

The coastal zone in Maryland comprises 66% of the total land area of the State. Bordering this coastal area is over 4,300 miles of shoreline along the Atlantic Ocean, coastal bays and Chesapeake Bay, and their tributaries. These shoreline areas are affected by a variety of hazards, particularly coastal erosion and sea level rise. Coastal hazards represent significant threats to resources and infrastructure in Maryland's coastal zone.

Shoreline erosion is an ongoing problem; Maryland loses approximately 260 acres of land each year to shore erosion. The unconsolidated nature of many shoreline sediments makes them particularly susceptible to erosive forces. In addition, extensive stretches of shoreline are exposed to a large fetch and thereby are threatened by both storm-induced erosion and chronic wave action. The impacts of erosion include the loss of land and its associated economic, cultural and ecological values and degraded water quality resulting from increased sediment and nutrient loads. Reduced water quality, in turn, impacts living resources.

Shore erosion is compounded by the effects of sea level rise, which increases the areas exposed to and affected by erosion. The historical average rate of sea level rise in Maryland is between 3-4 mm per year or 1 foot per century; a rate nearly twice the global average. However, current scientific research shows that rates will accelerate, resulting in a projected rise of two to three feet along Maryland's shores by the year 2100.

Over the past five years, the Program has successfully participated in the development of policy and implementation plans to help reduce the threat coastal hazards pose to coastal communities. To increase public awareness of the issues, the Program has also held educational workshops and information sessions discussing coastal hazards and how these risks to life and property can be reduced through non-traditional and non-regulatory mitigation mechanisms.



Shore erosion in Calvert County

http://www.dnr.state.md.us/bays/czm

Coastal Hazards: Shoreline Erosion

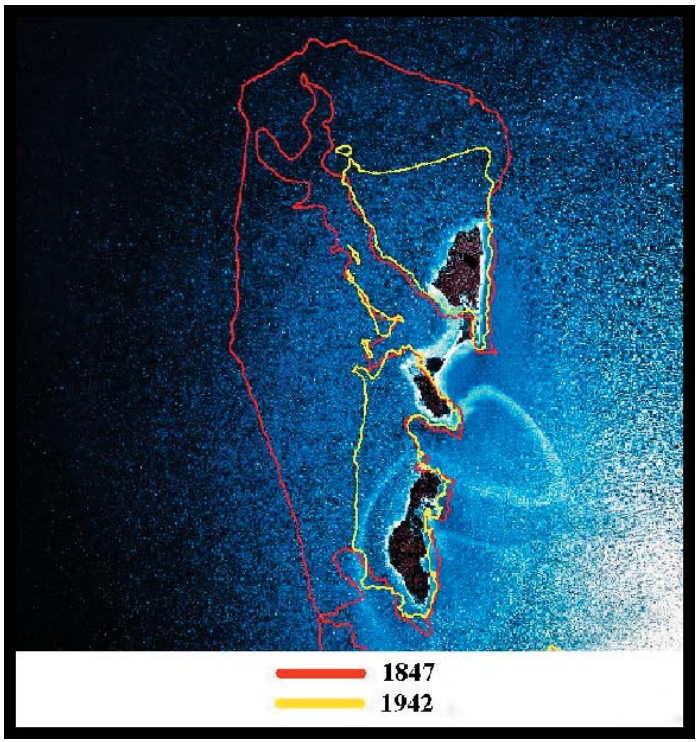
Shore erosion planning became a core Program task in the last five years. In response to citizen concerns over the State's capacity to address shoreline erosion threats, the Maryland General Assembly passed Resolution 19 during the 1999 legislative session. It requested the Governor to establish a Shore Erosion Task Force to: 1) identify shore erosion needs by county; 2) clarify local, State and federal roles; 3) establish shore erosion plans; and 4) review contributing factors to shore erosion.

Program staff assisted the Task Force in drafting their conclusions and recommendations in a Final Report in 2000. The report broadly outlined nine issues that should be addressed to mitigate shore erosion hazards. These recommendations related to developing regional shore erosion control strategies, establishing project review/ implementation and funding criteria, acquiring critical data sets, and increasing outreach.

Since 2000, the Coastal Program has allocated considerable staff and financial resources to address the recommendations. The Program is taking a regional approach to shore erosion hazards by developing a data intensive regional assessment tool to target shorelines for structural or non-structural response options. Two pilot assessments have been completed under a partnership agreement with Dorchester and St. Mary's Counties. The assessment tools focus localized erosive conditions and aim to strike a balance between the need to protect infrastructure with the need to maintain shoreline habitat.

To develop the assessment, the Program utilized federal funds to update Maryland's Shoreline Changes Maps and map environmental and infrastructure resources. The Shoreline Changes Maps for the 16 coastal counties will be available in 2003. Beginning May 2003, fieldwork was initiated to conduct a comprehensive shoreline inventory along the tidal shoreline of Maryland. The results of the survey will be developed into digital maps that identify the general bank condition/land use and will quantify water dependent structures along the shoreline like erosion control measures. These maps will be used to refine the recommendations of the regional assessment tool and will assist in targeting shoreline restoration sites. This data set will also further the State's ability to assess the cumulative impacts of past shoreline modifications.

James Island Shoreline Change
1847-1994



Map created by Zoe Johnson

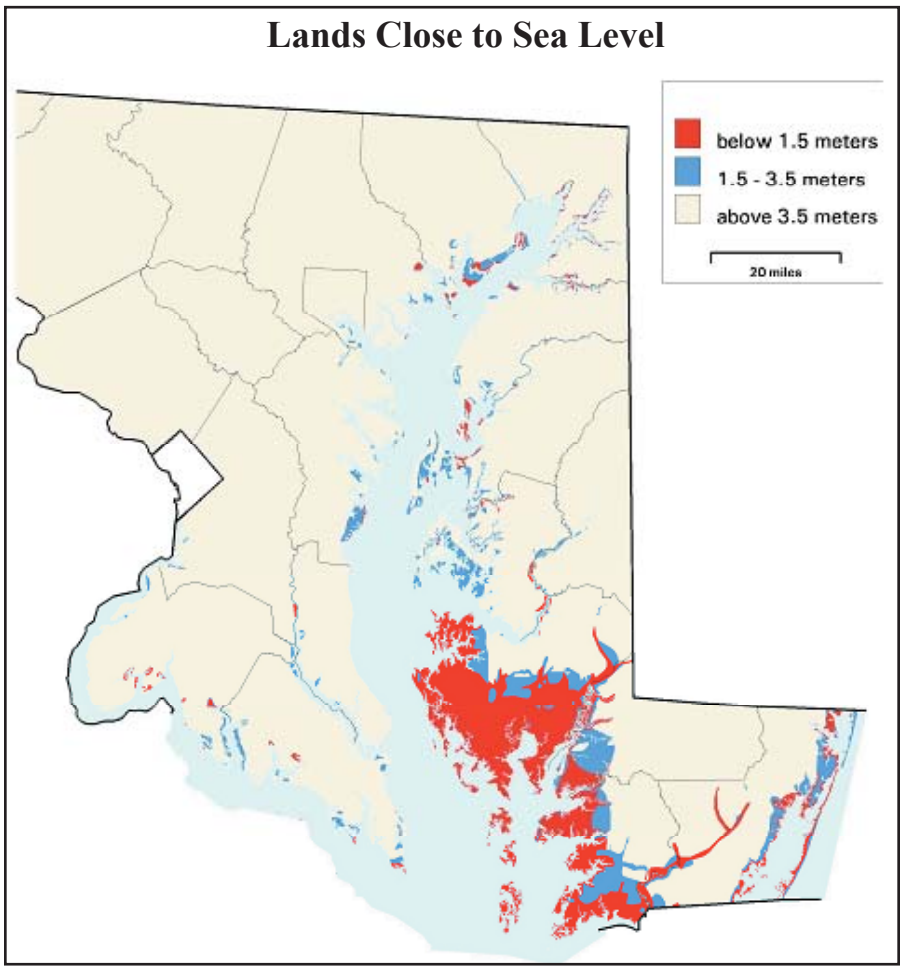
Shore erosion in Calvert County

The Coastal Program also works closely with the Department of Natural Resources Shore Erosion Control Program to provide financial and technical assistance to local governments and private landowners to resolve shoreline erosion problems. The Shore Erosion Control Program works with landowners to complete both nonstructural and structural projects in Maryland's tidal waters. The projects create and protect wetlands, which help buffer wave energy, absorb nutrients, and provide habitat.

Coastal Hazards: Sea Level Rise

Maryland's diverse coastline is particularly vulnerable to rising sea levels. With a documented rise of 1 foot in the last century, changes to Maryland's nearshore environment have already been detected. Troublesome to planners and property owners alike is that the current rate of sea level rise is expected to double, resulting in a rise of 2- 3 feet by the year 2100. A rise of such magnitude, nearly twice global predictions, threatens to exacerbate episodic coastal flooding events, increase on-going chronic shore erosion, and continue the slow but steady submergence of tidal wetlands and other low-lying lands. The steep cliffs, wetlands and marshes, tidal estuaries, sandy beaches, and barrier islands that comprise Maryland's coastal environment are all at risk.

Over the past five years, the Coastal Program has directed substantial efforts towards analyzing and addressing the impact of rising sea levels along Maryland's coastline. The Program has supported collaborative research into the physical impact of sea level rise to the coastlines of the Chesapeake Bay and Maryland's Coastal Bays. Up-to-date sea level rise information has been obtained through various research efforts of the U.S. Geological Survey, National Oceanic and Atmospheric Administration, University of Maryland, U.S. Environmental Protection Agency, National Estuarine Research Reserve, and Maryland Geological Survey. Additionally, a NOAA Coastal Management Fellow, hosted by the Program from 1998 to 2000, developed a "Sea Level Rise Response Strategy for the State of Maryland."



Source: Titus, James G. 1998. *Maryland Law Review* 57(4): 1307.

Research and data indicate that the Maryland coastal zone is highly susceptible to the impacts of sea level rise. In the short-term, coastal areas already under natural and human-induced stress are most vulnerable. However, much larger portions of the coastal zone will become threatened over time. Maryland's existing response capability provides the State only a moderate degree of protection from the impacts of sea level rise.

With this in mind, the strategy set forth both short and long-term objectives, along with key activities, to address the three primary impacts of sea level rise (erosion, flooding and inundation), and the resulting environmental and socio-economic implications of each. The strategy is comprised of four components: outreach and engagement; technology, data and research support; critical applications; and statewide policy initiatives and suggests a policy and implementation framework for reducing the State's overall vulnerability to sea level rise in the coming years.

Impacts of storm surge in Shadyside, Maryland where land is close to sea level.

Coastal Hazards: Dredge Material Management

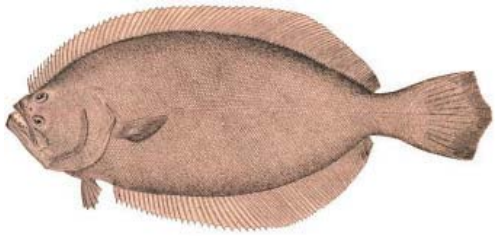
The health of ports, harbors, and marinas is crucial to the economic strength of the State of Maryland, and therefore must be protected. It is an important goal for the Coastal Program to create, restore, and maintain sustainable waterfronts while also developing new applications for underused areas and products. In relation to port and maritime operations, the Coastal Program has been involved in the statewide discussion of dredging and dredge material management. The Program's goal is to identify opportunities where dredge material can be used for coastal erosion management projects, thereby reducing the State's vulnerability to coastal hazards.

Baltimore Inner Harbor

Maryland's Port of Baltimore dredges over 4 million cubic yards of material annually in the inner port area and the associated approach channels. In addition, it is estimated that smaller marinas and harbors remove over 1 million cubic yards of material each year. In order to maintain the economic viability and create sustainable waterfronts of such ports and marinas, it is necessary to dredge harbor basins and associated channels on a regular basis. Much of this dredged material may then be used in a beneficial manner for other coastal projects, such as marsh restoration and shoreline erosion control.

The Program regularly provides comments on larger dredging activities in both the Chesapeake Bay and Coastal Bays regions through the State's environmental review process. In addition, Program staff participate in the Maryland Dredged Material Management Program's Management Committee which guides the long-term management of dredge material originating from the Port of Baltimore and its approach channels. Program staff ensure consideration of coastal hazards issues such as shore erosion management and sea level rise, in the development of dredge material disposal options by the Management Committee. The Program also acted as a broker to utilize dredge material from a location in Anne Arundel County in a beneficial manner at the Chesapeake Bay Environmental Science Center in Queen Anne's County. Other related activities have been the ongoing work with the Coastal Bays Navigation and Dredging Advisory Group and participation in the Coastal and Watershed Resources Advisory Committee sponsored Dredging Forum in April, 2002.

In order for large ships such as this one to access Baltimore, navigation channels must be maintained and dredged. The Coastal Program has worked with other State and federal agencies to find beneficial uses of the dredged material rather than depositing material overboard into open water or placing the material in a landfill.



Nonpoint Source Pollution

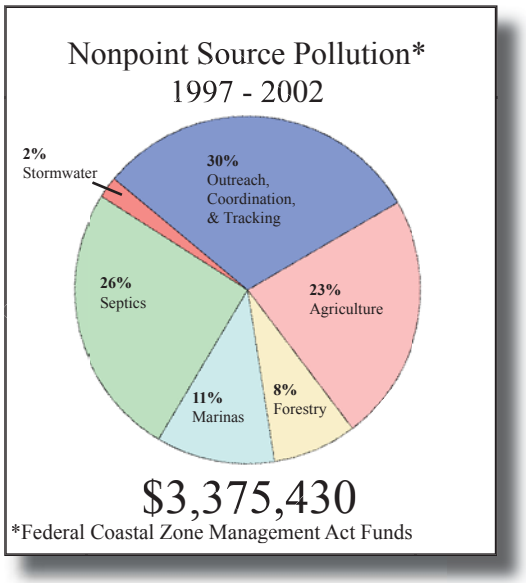
Agriculture
Clean Marina Program
On-site Sewage Disposal Systems

Nonpoint Source Pollution

In 1999, Maryland became the first state in the Nation to receive full approval of its Coastal Nonpoint Pollution Control Program from NOAA and the U.S. Environmental Protection Agency. Nonpoint source pollution (NPS), unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. NPS is caused when rainfall or snowmelt, moving over and through the ground, picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, coastal waters and underground sources of drinking water. In Maryland, including the coastal zone, NPS is a primary cause of water quality impairment.

In an effort to develop a more comprehensive solution to the problem of polluted runoff in coastal areas, the U.S. Congress expanded the Coastal Zone Management Act (CZMA) in 1990 to include Section 6217, "Protecting Coastal Waters." Section 6217 requires states to control nonpoint source pollution by implementing 56 management measures that prevent or reduce pollution from the following activities: urban development, agriculture, marinas and recreational boating, forestry and hydromodification. Coastal Nonpoint Pollution Control Programs must be approved by both NOAA and EPA.

The central purpose of Section 6217 is to strengthen the links between federal and state coastal zone management and water quality programs. In keeping with this purpose and the successful state-federal partnership to manage and protect coastal resources achieved by the CZMA, it was envisioned that Section 6217 would be coordinated with existing programs developed under Section 319 of the Clean Water Act (CWA). The goal is to enhance state and local land management efforts and to address activities that degrade coastal waters and coastal habitats. Since 1999, Maryland's Program has made significant progress by focusing on a wide range of issues including agriculture, on-site sewage disposal systems, and marinas.



Brad Grace, a certified clean marina operator. Photo courtesy of Maryland DNR.

http://www.dnr.state.md.us/bays/czm

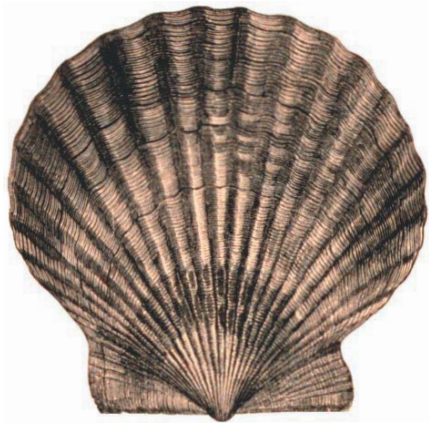
Nonpoint Source Pollution: Agriculture

Agriculture is a predominant feature of the Maryland landscape, playing a significant role in the State's history, culture, and environment. The Coastal Program has provided a significant level of funding to address agricultural nonpoint source (NPS) pollution in Maryland. Funding has been used to support Soil Conservation Districts who provide technical assistance to the agricultural community by: assisting with watershed planning; installing "Best Management Practices;" assisting with the development, review and implementation of Soil Conservation and Water Quality Plans; and implementing projects though the Maryland Agricultural Water Quality Cost-Share Program.

Soil Conservation and Water Quality Plans (SCWQP) are considered interdisciplinary due to the integration of specialists' expertise in soil and water conservation, wildlife, forestry, nutrient management, and crop production. Developing SCWQPs includes coordination with cooperating agencies, such as the U.S. Department of Agriculture, Maryland Department of Agriculture, Maryland Department of Natural Resources, National Fish and Wildlife Foundation, and the University of Maryland Cooperative Extension Service. A component of a SCWQP is the implementation of agronomic and structural Best Management Practices or BMPs. Examples of BMPs are conservation tillage, cover crops, crop residue use, nutrient management, and waste utilization. Such BMPs assist the agricultural community in meeting the goal of nutrient reduction as part of both the Chesapeake Bay 2000 Agreement and the Maryland Coastal Bays Program Management Plan.

Poultry operations comprise a significant number of farm operations on Maryland's Eastern Shore, and most of the farmers with animals use a waste storage facility. The Coastal Program has also contributed funding to evaluate and demonstrate alternative designs for animal waste storage.

Agriculture on Maryland's Eastern Shore. Photos courtesy of Maryland DNR and by Tim Connelly.



Nonpoint Source Pollution: Clean Marina Program

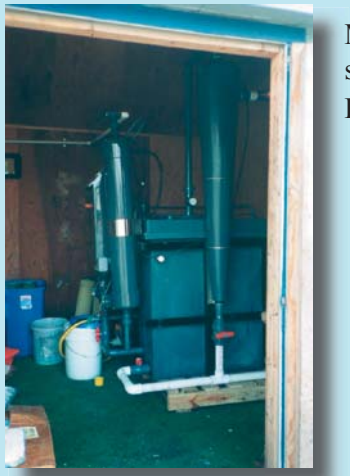
Coastal Program funding was used to develop and implement the Maryland Clean Marina Initiative. This initiative was created as a partnership with the Marine Trades Association of Maryland, Boat U.S./Clean Water Trust, the Maryland Department of the Environment, Maryland Environmental Service, U.S. Coast Guard, and the Maryland Sea Grant. The Maryland Clean Marina Initiative was created as a non-regulatory alternative for meeting the requirements of Section 6217 regarding control of nonpoint source pollution from boating facilities. Now a stand-alone Program, the Clean Marina Program promotes and celebrates the voluntary adoption of measures to reduce nonpoint source pollution from marinas and recreational boats. One hundred sixty-three marinas, boatyards, and yacht clubs statewide pledged to do their part to keep Maryland's waterways free of harmful chemicals, excess nutrients, and debris. As of December 2002, sixty-six of those marinas met specific criteria and were certified as "Clean Marinas."

The comprehensive nature of the Program contributes to its success. The State encourages marinas to adopt pollution prevention measures such as sewage pumpout stations and vacuum sanders through multiple avenues: workshops, publications, training materials, and demonstration projects. The initiative strives to create a market demand for Clean Marinas among boaters by publicizing the certification program, providing financial and technical assistance, and by distributing clean boating information at boat shows and trade fairs. The most significant accomplishment made by this highly successful Program is that it has made pollution reduction easier for marina owners and the everyday recreational boater.

Thousands of Petroleum Control Kits to educate boaters about methods to control the release of petroleum products into surface waters have been distributed since the Program began. The kits contain either an oil absorbent pad or a bioremediating bilge boom, a sticker describing its use and disposal, and a petroleum control brochure. In addition to the kits, Coastal Program funds were used to create pollution prevention guidebooks, sponsor educational workshops, distribute tip sheets to boaters and provide grants to marina operators for pollution prevention equipment.

Clean Marina Best Management Practices

Marinas, boatyards and yacht clubs that adopt a significant portion of the best management practices suggested within the Clean Marina Guidebook are recognized as Maryland Clean Marinas or Clean Marina Partners.



Washwater Recycling System

Vacuum Sander

Fuel Pump

Photos courtesy of Maryland DNR.

http://www.dnr.state.md.us/bays/czm

Nonpoint Source Pollution: On-Site Sewage Disposal Systems

Approximately, one out of every five households in Maryland relies on a septic system for household waste removal. Nutrient loads from septic systems to surface and ground waters are a growing concern since many systems use 50 year-old technologies that are not designed to remove nutrient pollution, the key type of pollution targeted by the Chesapeake and Atlantic Coastal Bays restoration efforts.

The federal Coastal Nonpoint Pollution Control Program requires states to ensure that all new onsite disposal systems (OSDS) are properly constructed and placed so as to prevent pollution of surface and ground waters and that existing OSDS are operated and maintained to prevent the discharge of pollutants. In Maryland, this measure is satisfied by various State codes that serve to reduce the impact of OSDS, inspection programs, homeowners education about septic maintenance and innovative systems, and workshops to train local governments and contractors about innovative systems. Maryland is currently using federal Coastal Nonpoint Pollution Control Program funds as follows:

- Eight coastal counties are developing accurate and complete inventories, databases, and maps of properties served by septic systems.
- Four counties and one tri-county council are developing OSDS management strategies designed to enhance protection of areas known to have nitrogen-sensitive waters.
- Training workshops were conducted by the Maryland Department of Environment that addressed the design, installation, inspection, maintenance, and operation of OSDS. Workshops included the following:
    - Innovative and Alternative Onsite Sewage Disposal Systems Design and Construction (2 workshops)
    - Construction of Sand Mound OSDS (3 workshops)
    - Best Management Practices (3 workshops)
    - Site Evaluation Training (2 two-day workshops)

  More than 400 individuals attended the workshops and attendance had to be limited at several workshops as maximum capacity was met or exceeded.
- A demonstration study is underway to help local governments quantify septic system inputs to surface waters. The University of Maryland, Center for Environmental Science is using the funds to assess and map the plumes of sewage derived nitrogen within the Choptank and Patuxent Rivers.
- A Coastal Decision-Makers' Workshop entitled: "Reducing Nitrogen Pollution from Septic Systems" was sponsored by the Coastal Program, the Maryland Chesapeake Bay Tributary Strategies Development Workgroup, and the National Estuarine Research Reserve Program.

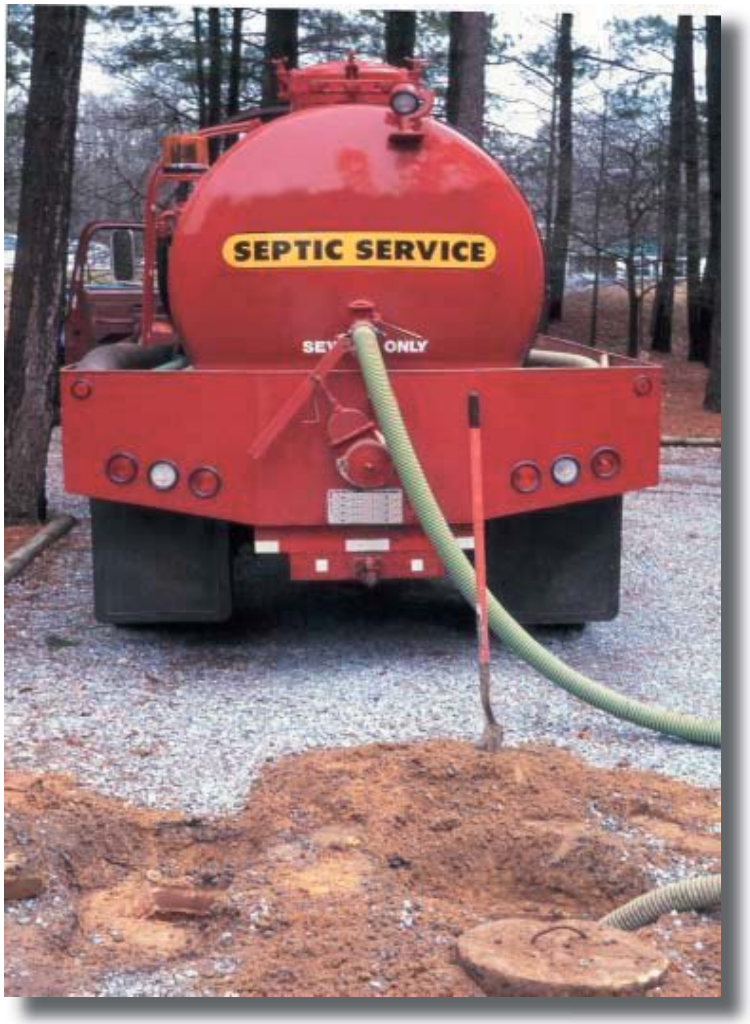


Photo courtesy of Worcester County.

Sensitive Areas & Growth Management

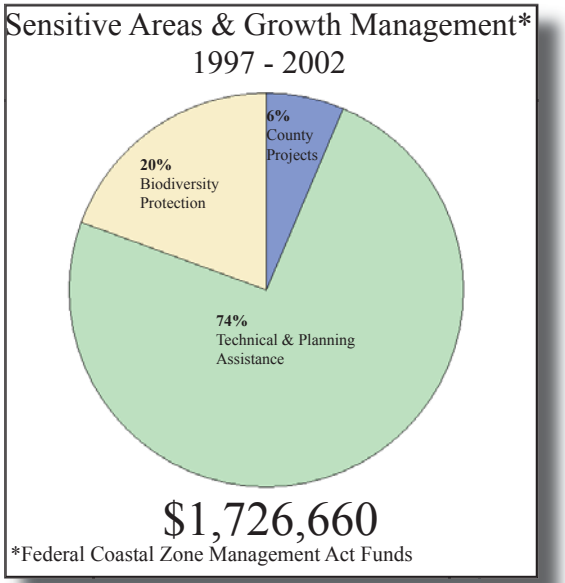
Coastal County Sensitive Area Plans
Technical Assistance & Outreach
Biodiversity Protection

Sensitive Areas & Growth Management

Maryland's focus on sensitive areas and growth management was directed by the *Economic Growth, Resource Protection, and Planning Act of 1992*. Pursuant to this Act, each county was required to incorporate a sensitive areas element and seven "visions" into their county comprehensive plan. The sensitive areas element was required to contain goals, objectives, principles, policies, and standards designed to protect sensitive areas from the adverse effects of development. Sensitive areas included the following: streams and their buffers, 100 year floodplains, habitats of threatened and endangered species, and steep slopes. Maryland's Coastal Program supported these efforts in three primary ways:

(1) providing financial assistance to coastal local governments to update and incorporate their sensitive areas elements,
(2) providing technical and planning assistance to local governments, and
(3) supporting biodiversity protection planning in sensitive areas.

Development surrounding a wetlands preserve on Kent Island, Maryland. Photo by Tom Darden.



http://www.dnr.state.md.us/bays/czm

Sensitive Areas & Growth Management: Coastal County Sensitive Areas Plans

Maryland's Coastal Program provided technical and financial assistance to twelve local governments from 1992-1999, helping them comply with the 1992 Growth Act through the development and implementation of sensitive areas elements. Funding was awarded to (1) revise and finalize the county sensitive areas elements, including changes to implementing ordinances, and (2) assist in implementing the sensitive areas elements that were adopted. This support helped coastal counties that otherwise would not have had the financial and technical resources to complete the required comprehensive plans and ordinances and to follow up with implementation and tracking. Activities have included inventorying sensitive areas, modeling different growth scenarios, GIS mapping of sensitive lands, as well as the actual development of the elements. Following are examples of projects funded between 1997 and 2002.

Cecil County: *"Urban Growth Boundary Plan."*
Cecil County sought to create an Urban Growth Boundary Plan to influence the location and pace of future growth by extending water and sewer services from existing municipal systems to the County's growth area. The County asserted that until a water supply is available and sewage collection and treatment facilities are constructed, a significant amount of growth would occur at low densities in environmentally sensitive and rural areas of the County. The Plan was designed to: (1) provide the necessary infrastructure to make the growth area attractive to high density development; (2) establish procedures to initiate county/town cooperation on the extension of water and sewer service into urban growth boundaries around municipalities; and (3) reduce development pressures on rural areas of the County, thereby preserving its agricultural character and economy. The Urban Growth Boundary Plan helped the County determine how to expand existing municipal water and sewer systems into the growth area, making these services available to development.

Anne Arundel County: *"Sensitive Area Elements of Small Area Plans."*
This project focused on the development of regulations, guidelines, and incentives for the protection of sensitive areas through public participation in two Small Area Plans. The project was designed to (1) assess the adequacy of riparian buffers, including the identification of sensitive areas that may require expanded buffers; (2) involve local citizens in identifying sensitive areas and developing protection standards; and (3) use regulations, incentives, and public education to protect and expand riparian buffers. The two areas selected represented different components of Anne Arundel County. The Mayo/Edgewater plan addressed the Bay front rivers and numerous tributary streams, while the Crofton plan lies inland and addressed fewer and narrower streams.

Calvert County: "*Impacts of Alternative Land Use Patterns on Forest Interior Dwelling (FID) Bird Habitat."*
This project focused on forest interior dwelling bird (FID) habitat in Calvert County by investigating how development patterns impact FID habitat and identifying those patterns with the least impact. As a result of this project and its associated modeling exercises: (1) amendments to the County's cluster subdivision regulations and zoning ordinance have been proposed to the Planning Board and County Commissioners for inclusion in the County's comprehensive re-zoning process; (2) FID bird habitat maps have been drafted; (3) changes have been proposed to the land conservation/ preservation and growth management tools used in the County; and (4) existing and proposed reforestation programs will give high priority to expanding forest interior habitat.

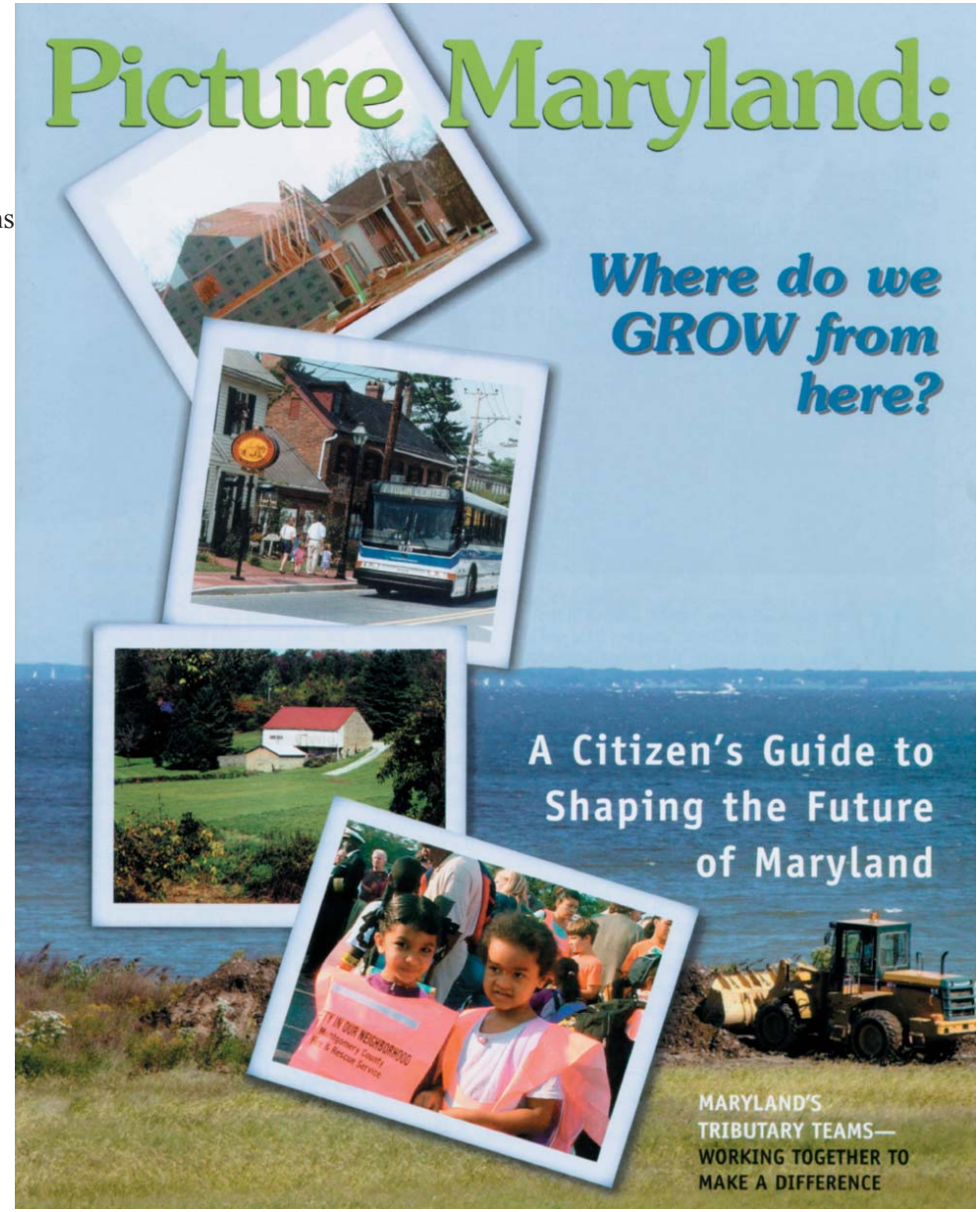
Screech Owl. Photo by Tom Darden.

Sensitive Areas & Growth Management: Technical Assistance & Outreach

The *Economic Growth, Resource Protection and Planning Act of 1992* and the *1997 Smart Growth and Neighborhood Conservation Initiative* provided the State with new tools to work with local governments to manage growth and protect valuable environmental resources. Coastal Program funds were used by the Department of Natural Resources' Growth and Resource Conservation Division to help coastal local governments strengthen their planning activities and develop regulations consistent with and complimentary to the State laws.

Division activities included:

- Providing assistance to local governments to develop and implement sensitive areas elements of local comprehensive plans;
- Helping local governments identify and implement appropriate models, techniques, and practices for better land use management;
- Reviewing local comprehensive plans, sensitive area elements, and local codes and ordinances;
- Hosting a workshop on watershed planning; and
- Co-hosting a series of workshops on green design and low impact development.

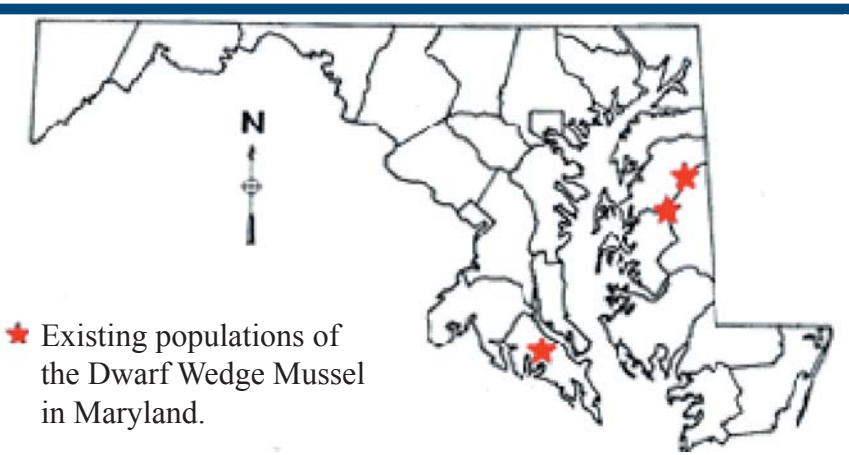


As a public outreach tool, the Maryland Coastal Program and Tributary Teams sponsored a citizens guide on growth management for distribution in the *Baltimore Sun.*

http://www.dnr.state.md.us/bays/czm

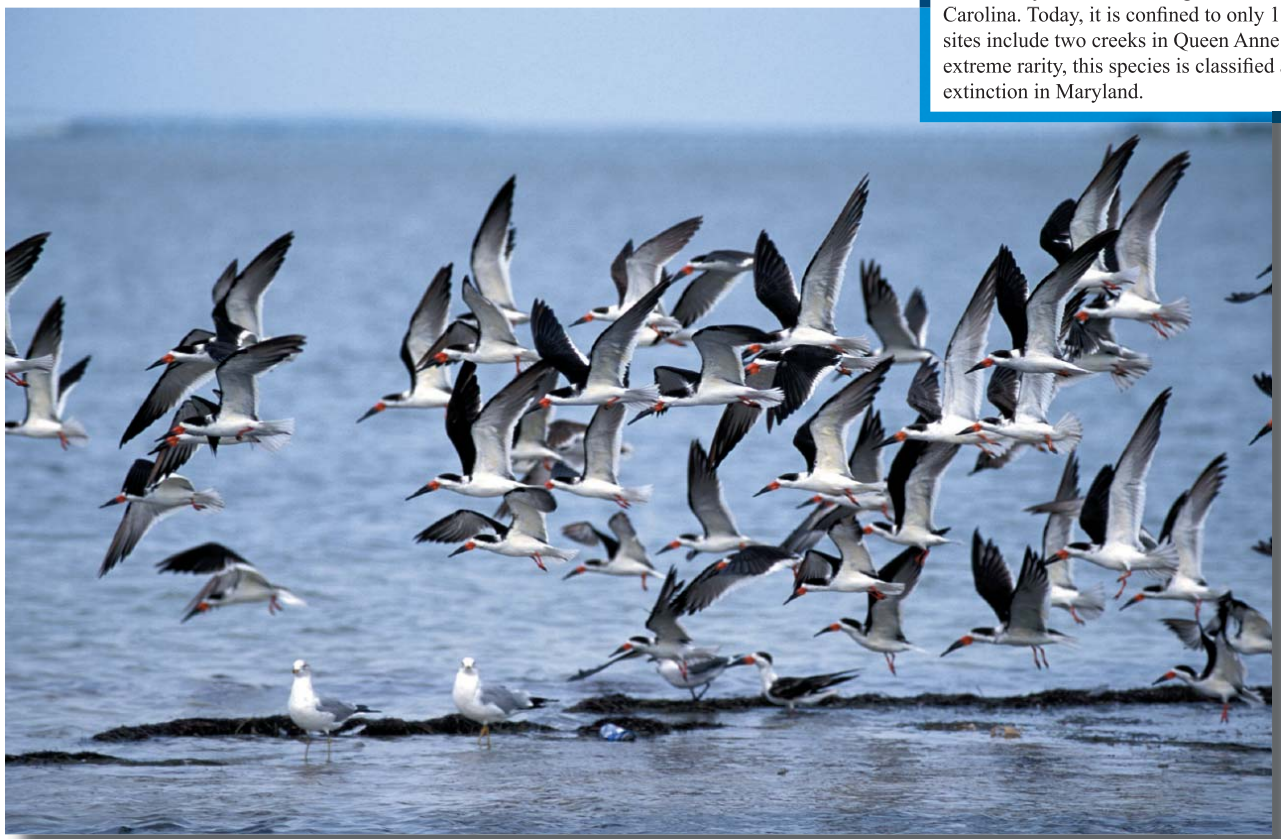
Sensitive Areas & Growth Management: Biodiversity Protection

The Coastal Program provided funding to Maryland's Natural Heritage Program for field surveys to determine the occurrence and distribution of rare species' habitats and high quality natural communities. The ecological values, threats, and management needs were determined for each site. Virtually all of the current and historical locations for threatened and endangered species and many sites with potential habitat for rare species in coastal counties have been surveyed. The Natural Heritage Program provided assistance to local planning and zoning agencies to strengthen sensitive areas protection measures through planning and environmental review of land use/development proposals.



★ Existing populations of the Dwarf Wedge Mussel in Maryland.

Historically, the Dwarf Wedge Mussel has been found at 70 sites from New Brunswick to North Carolina. Today, it is confined to only 10 known sites, three of which are in Maryland. These three sites include two creeks in Queen Anne's County and one in St. Mary's County. Because of its extreme rarity, this species is classified as a State Endangered Species, one that is in jeopardy of extinction in Maryland.



Black Skimmers

Black Skimmers, *Rynchops niger*, are classified as threatened species in Maryland. They are present in Maryland from April to November, preferring to nest in colonies on coastal beaches and dredge spoil islands. The 150-350 pairs which nest in Maryland are concentrated along the Atlantic coast of Worcester County. Some will also breed in the lower Chesapeake Bay adjacent to Dorchester County. Black skimmers spend the winter along the southeast coast, South Carolina to Florida. Photo courtesy of U.S. Fish and Wildlife.

Watershed Planning

Watershed Restoration Action Strategies
Monitoring & Assessment

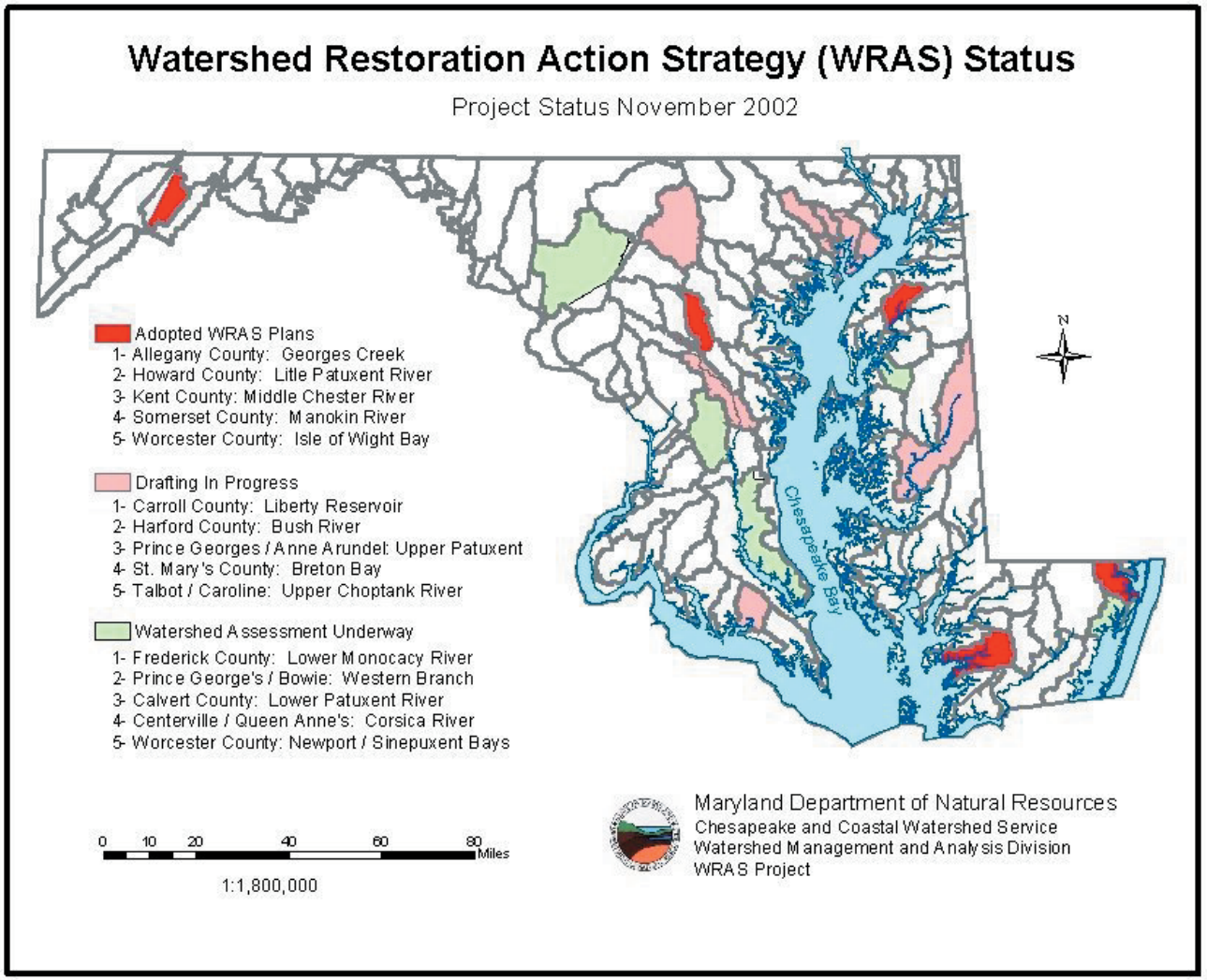
Watershed Planning

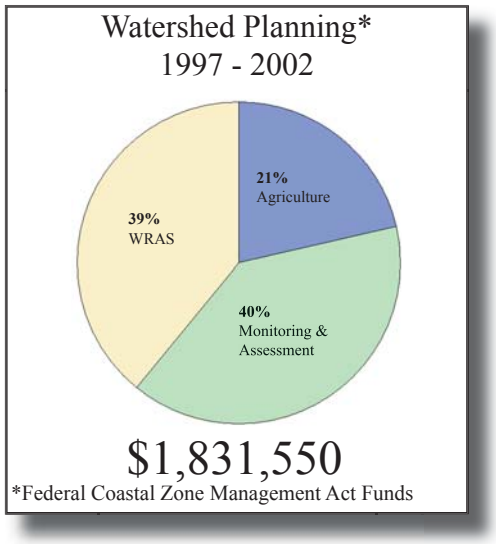
The Maryland Coastal Program has recognized the importance of taking a watershed approach to managing coastal resources and improving water quality. Using a watershed approach enables Maryland to address natural resource issues that cross jurisdictional boundaries. It integrates concerns about water quality, water quantity, and habitat and coordinates insights from the natural and social sciences. Over the past five years, Maryland's Coastal Program has worked at a watershed level to promote effective watershed planning by:

(1) Developing Watershed Restoration Action Strategies (WRAS)

(2) Enhancing the State's monitoring and assessment capabilities through the Targeted Watersheds and Maryland Biological Stream Survey Programs; and

(3) Funding the delivery of technical assistance to the agricultural community.





http://www.dnr.state.md.us/bays/czm

Watershed Planning: Watershed Restoration Action Strategies

The Watershed Restoration Action Strategy (WRAS) Partnership Program is a multi-year, multi-program approach to integrated watershed protection and restoration. The goal is to comprehensively design and implement water quality and habitat improvement activities on a local watershed scale. Maryland's Coastal Program was a critical partner in the development of the WRAS Program and continues to work with local governments, state agencies, and universities to develop and implement watershed strategies. Each strategy includes a watershed characterization, stream corridor assessment, nutrient synoptic survey, public participation, goal setting, and action plan development.

WRAS watershed targeting is based on Maryland's Clean Water Action Plan (1998), which called for the assessment of the condition of the State's waters. The resulting Unified Watershed Assessment (UWA) defined a set of those watersheds that were most in need of restoration and/or protection. Funding for development and implementation of WRAS is provided from both the Coastal Program and the State's Nonpoint Source Pollution Control Program (Section 319 Clean Water Act).

Development of strategies for individual watersheds is a county-led process resulting in the development of priority water quality and habitat preservation and restoration actions within a comprehensive management context. The WRAS Partnership Program recognizes that most of the decisions regarding land use, zoning, open space, etc., are the responsibility of local governments. In addition, county governments possess the local knowledge to develop watershed assessments and plans, and are able to commit resources to implementation. Each county actively solicits input from a variety of partners, such as State agencies, Soil Conservation Districts, landowners, or local watershed associations.

Photos are taken during the Stream Corridor Assessment to document the condition of streams in each watershed.

A completed WRAS is a work plan based on an assessment of natural resource conditions and scientific monitoring data. The strategy identifies the most important causes of water pollution and resource degradation, and details actions, as well as responsible parties, to address the problems. It also provides milestones for measuring progress. The WRAS identifies areas of concern, needed monitoring, gaps in information, mitigation options, and restoration and protection opportunities.

In 2000, three coastal counties were selected as pilots to partner with the Department of Natural Resources in the development of a strategy in three priority watersheds. Building on the Program's success, additional counties partnered with the State in both 2001 and 2002. Comprehensive watershed plans were completed for the original counties, and plans for the remaining counties are well underway.

http://www.dnr.state.md.us/bays/czm

Watershed Planning: Monitoring & Assessment

The **Targeted Watershed Project** is a multi-agency initiative to improve water quality and restore living resources in several key tributaries to the Chesapeake Bay. Established in 1989, the project sought to identify stream systems which were either threatened by multiple sources of degradation from urbanization, or which contributed a disproportionately high level of nutrients to the Chesapeake Bay from nonpoint sources of pollution. The German Branch, a third-order coastal plain stream of Maryland's Eastern Shore, is one of four watersheds selected in the Maryland Targeted Watershed Project. The drainage area is approximately 19.5 square miles. Ranking systems based on land use patterns identified the Tuckahoe Creek Watershed (where German Branch is located) as the sixth highest in Maryland for potential nitrogen release. Coastal Program funds were used to evaluate the effects and establish the temporal relationship between implementation of best management practices, that reduce nitrogen entry into the subsurface flow system, and changes in watershed baseflow nitrogen discharge rates.

Prince George's County Department of Environmental Resources performed a **study of domestic septic systems and their impacts** on the Patuxent River Watershed. Prior to this effort, the County developed an initial landscape level assessment of the extent of septic system usage and practices in the watershed and nitrogen loading estimates. Coastal Program funding was used to apply the assessment and analytical tools watershed-wide in an effort to develop alternative and enhanced planning and growth management programs.

The **Maryland Biological Stream Survey** was designed to take periodic snapshots of our streams, identify our best and worst areas, find out what caused them to become bad or stay healthy, and help target streams and watersheds for protection, restoration, or both. In short, the MBSS provides information critical to managing our aquatic resources. Coastal Program funds have enabled MBSS staff to provide unbiased estimates of the condition of streams and rivers of Maryland on a local (e.g., drainage basin or county) as well as a statewide scale. To date, the MBSS has focused on wadeable, headwater streams. The survey is based on a probabilistic stream sampling approach where random selections are made from all sections of streams in the State which can physically be sampled. The approach supports statistically-valid population estimation of variables of interest (e.g., largemouth bass densities, miles of streams with degraded physical habitat, etc.). When repeated, the MBSS will also provide a basis for assessing future changes in ecological condition of flowing waters of the State. At present, plans are to continue the MBSS and develop a quantitative sampling approach for larger streams and rivers.

Maryland Biological Stream Survey
Streams of all shapes and sizes are surveyed and samples are analyzed at the laboratory. Photos courtesy of Maryland Department of Natural Resources, MBSS.

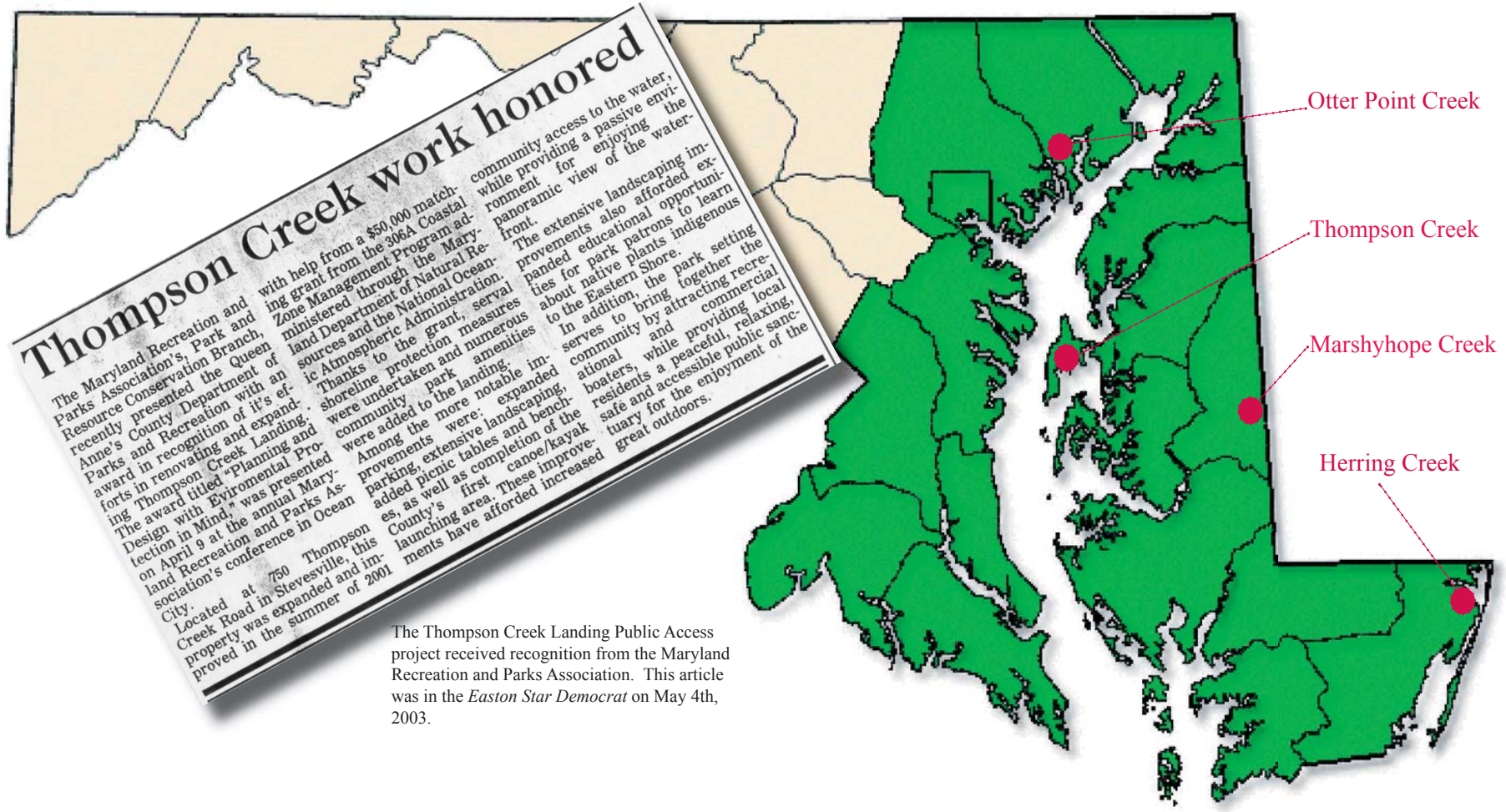



Public Access

Public Access Map & Projects

Public Access

From 1997 through 2002, the Coastal Program funded four comprehensive public access projects. As the coastal population in Maryland increases, more access points are needed for recreational boating and fishing. Using funds from Section 306A of the Coastal Zone Management Act, the Coastal Resource Improvement Program, the Maryland Coastal Program improved existing coastal access sites through trail improvements, boardwalk and pier construction, and improved existing site facilities. In addition to site improvements, the Coastal Program used the funding to acquire property for coastal access sites.



Thompson Creek work honored

The Maryland Recreation and Parks Association's, Park and Resource Conservation Branch, recently presented the Queen Anne's County Department of Parks and Recreation with an award in recognition of it's efforts in renovating and expanding Thompson Creek Landing. The award titled "Planning and Design with Evironmental Protection in Mind," was presented on April 9 at the annual Maryland Recreation and Parks Association's conference in Ocean City.

Located at 750 Thompson Creek Road in Stevesville, this property was expanded and improved in the summer of 2001 with help from a $50,000 matching grant from the 306A Coastal Zone Management Program administered through the Maryland Department of Natural Resources and the National Oceanic Atmospheric Administration. Thanks to the grant, serval shoreline protection measures were undertaken and numerous community park amenities were added to the landing. Among the more notable improvements were: expanded parking, extensive landscaping, added picnic tables and benches, as well as completion of the County's first canoe/kayak launching area. These improvements have afforded increased community access to the water, while providing a passive environment for enjoying the panoramic view of the waterfront.

The extensive landscaping improvements also afforded expanded educational opportunities for park patrons to learn about native plants indigenous to the Eastern Shore.

In addition, the park setting serves to bring together the community by attracting recreational and commercial boaters, while providing local residents a peaceful, relaxing, safe and accessible public sanctuary for the enjoyment of the great outdoors.

The Thompson Creek Landing Public Access project received recognition from the Maryland Recreation and Parks Association. This article was in the *Easton Star Democrat* on May 4th, 2003.

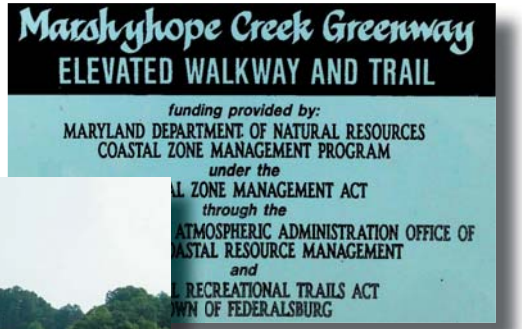
Public Access: Projects

Herring Creek - 1997

*new parking area
*walking trails & bridges
*restrooms
*overlooks
*native landscaping
*pavilion

Marshyhope Creek - 1998

*expanded greenway corridor
*trail system
*pedestrian bridge
*native landscaping



Thompson Creek - 1999

*pier improvement
*canoe & kayak launch
*native landscaping
*picnic area
*expanded boat launch
*parking improvements

Otter Point Creek - 2001 & 2002

*pier replacement & upgrade
*new parking area
*native landscaping

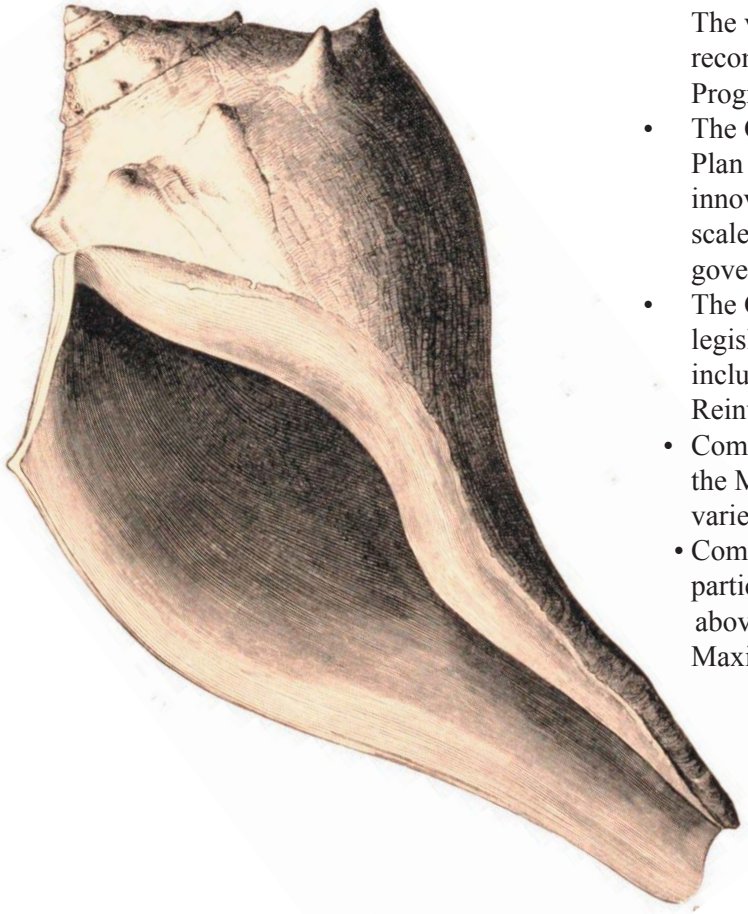
Improvements to the Otter Point Creek public access sites are currently underway. By 2003, this pier will be replaced by a new pier that is compliant with the American Disabilities Act.

Chesapeake & Coastal Watershed Resources Advisory Committee

Coastal & Watershed Resources Advisory Committee

Since 1976, the Maryland Coastal and Watershed Resources Advisory Committee (CWRAC) has served a unique and valuable role in assisting the Department of Natural Resources and Coastal Program in managing the State's coast. CWRAC advises the Coastal Program on policy issues and is the primary organization that citizens may use to voice their ideas and opinions about coastal resources management. The diversified membership on the committee allows for informed discussion of coastal issues providing important input into state programs and policies. This membership includes concerned citizens, representatives of business, civic and conservation groups, and local government agencies.

Coastal & Watershed Resources Advisory Committee: Highlights



The following are some highlights from the past five years (1997-2002):

- The Committee sponsored an issue forum on climate change in Maryland. This forum was part of the Chesapeake 2000 development process and brought together technical experts and policy makers to discuss the role of climate change in managing the Chesapeake Bay.
- The Committee met and reviewed the draft Chesapeake 2000 Agreement. The views of all members were taken into account and included in the list of recommendations submitted to the Secretary of DNR and the Chesapeake Bay Program.
- The Committee sponsored, in association with the Dredged Material Management Plan (DMMP) Citizen's Advisory Committee, a forum on the beneficial and innovative use of dredged material. The Forum focused on both small and large-scale projects. The audience included technical experts, federal, state and local government representatives, contractors, and environmental groups.
- The Committee is regularly updated on and comments on State and federal legislation related to coastal issues. Over the past five years their focus has included: Coastal Zone Management Act Reauthorization, Conservation and Reinvestment Act, and Critical Areas Legislation.
- Committee members participate in general outreach efforts, have a presence on the Maryland Coastal Program web site, and have set up information displays at a variety of venues, including the Volvo Ocean Race.
- Committee meetings provide an opportunity for members to learn about and participate in federal and state coastal activities. In addition to the topics listed above, the committee has discussed watershed planning, shore erosion, Total Maximum Daily Loads, and coastal performance measures.

http://www.dnr.state.md.us/bays/czm

Sustainable Coastal Communities & Ecosystems

Sustainable Coastal Communities & Ecosystems

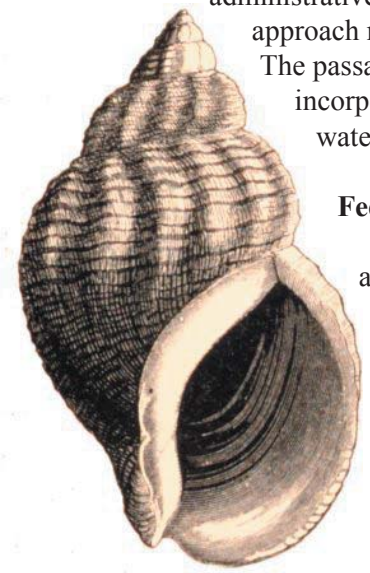
The Chesapeake and Altantic Coastal Bays Critical Area Program and the State's Federal Consistency Program are two key components of Maryland's Coastal Program. Each has provided a foundation for the Coastal Program to build on as it works towards sustainable coastal communities and ecosystems, in addition to improving government efficiency in the State. Both are comprehensive in nature, covering multiple issues and providing a legal framework for restoration and protection of coastal resources in Maryland.

Critical Area

The incorporation of the provisions of Maryland's Chesapeake Bay Critical Area Law into Maryland's Coastal Program in 1986, significantly improved the effectiveness of the State's Coastal Program. This action expanded the role of local governments in the implementation of the Program, provided more specificity as to how activities were to be undertaken along the shoreline of the Chesapeake Bay and tidewater tributaries, and expanded the use of intervention powers of the State.

The Act identified all areas within 1000 feet of tidal waters or tidal wetlands as special management areas. Local governments were required to develop and implement detailed management programs for these areas to minimize adverse impacts on water quality; conserve fish, plant, and wildlife habitat; and address potential secondary impacts resulting from development. A local jurisdiction's Critical Area is divided into three management areas - Intensely Developed Areas, Limited Development Areas and Resource Conservation Areas - where different types and intensities of uses are allowed to occur. Specific management approaches were developed for the following activities: water dependent facilities, shore erosion protection measures, forestry activities, agricultural activities, habitat protection areas, sand and gravel mining, and natural parks.

Since 1997, over $2.6 million dollars of federal Coastal Program funds have been provided to local governments to help implement their local Critical Area Programs. These funds have been used for: the comprehensive review and updating of the local Critical Area Programs, review of proposed projects to ensure compliance with the law and regulations, review and revision of local laws and ordinances to ensure compliance, administrative and legal support to carry out implementation and program enforcement, and education to help foster a more sensitive approach regarding the impact of land use on the Bay and its tributaries.



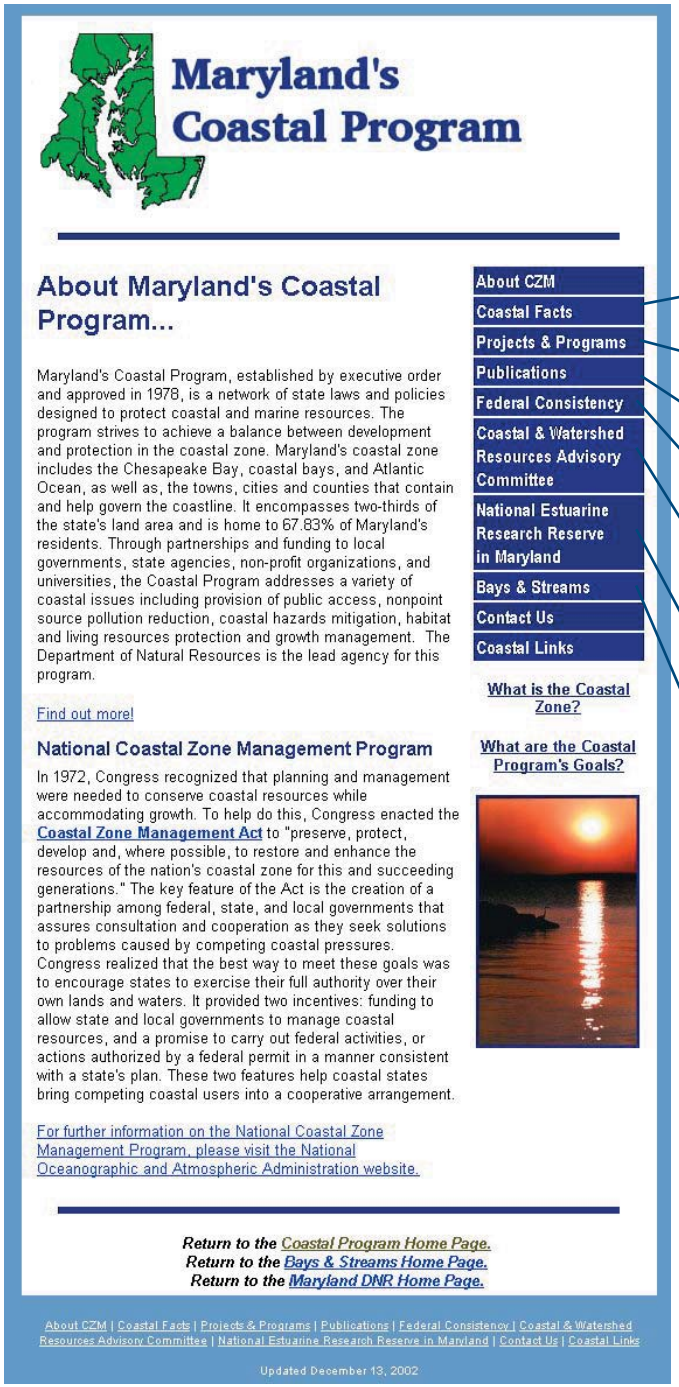
The passage of the Atlantic Coastal Bays Protection Act, in 2002, was another significant action for the Coastal Program. By incorporating the coastal bays and tributary streams into the existing Chesapeake Bay Critical Area Protection Act, the coastal waters of the entire State are now protected by this important landmark legislation.

Federal Consistency

In addition to federal funds, the Coastal Zone Management Act provides the State with the authority to review federal activities, licenses and permits, and financial assistance awards to ensure their consistency with the State's federally approved Coastal Program. Reviews are coordinated through the Department of Environment. Recent reviews have included the license reissuance for the Cove Point Liquid Natural Gas Facility, Cox Creek Dredged Material Containment Facility, and the laying of 310 miles of fiber optic cable throughout the Chesapeake Bay and its tributaries. Rather than being a trigger for controversy, consistency reviews provide federal agencies and permit applicants with a process to identify and resolve potential conflicts before costly commitments to a project have been made.

http://www.dnr.state.md.us/bays/czm

Notes



Visit Our Web Site!

http://www.dnr.state.md.us/bays/czm

Coastal Facts
Lists numerous facts unique to the Maryland coastal zone including population, land area, sea level rise rates, and more!

Projects & Programs
Provides a list of recent projects sponsored by the Coastal Program along with links to get more information.

Publications
Provides a list of Coastal Program publications, along with links to download the publications in *.pdf format.

Federal Consistency
Gives a brief overview of federal consistency along with contact information for Maryland's Program.

CWRAC (Coastal & Watershed Resources Advisory Committee)
Describes the goals and projects of this committee, which represents the public, local government, and private industry in Maryland's Coastal Program.

National Estuarine Research Reserve in Maryland
Provides a link to the Chesapeake Bay National Estuarine Research Reserve home page, which the Maryland Coastal Program works closely with on some issues.

Bays & Streams
A link to the Bays and Streams home page of the Chesapeake Bay Streams, Coastal Bays, and Watersheds web site, providing general information concerning activities throughout the State.